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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/061,307	02/04/2002	Hiroshi Nagacda	1344.1084	2344

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EXAMINER

PAK, SUNG H

ART UNIT PAPER NUMBER

2874

DATE MAILED: 01/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/061,307	NAGAEDA ET AL. IV	
	Examiner	Art Unit	
	Sung H. Pak	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 7-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10 and 16 is/are rejected.
- 7) ☒ Claim(s) 11-15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

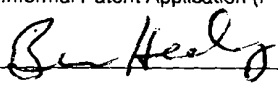
Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>0202</u> | 6) <input type="checkbox"/> Other:  |

DETAILED ACTION

Information Disclosure Statement

All references submitted in the information disclosure statement filed 2/04/2002 have been considered. Please refer to the copy of PTO-1449 enclosed herewith.

Specification

The abstract of the disclosure is objected to because it is too long. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet **within the range of 50 to 150 words**. It is important that the abstract **not exceed 150 words** in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

Claims 11-12 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim *should refer to other claims in the alternative only*. See MPEP § 608.01(n). Accordingly, the claims 11-12 have not been further treated on the merits.

Claim 1 is objected to because of the following informalities:

Claim 1 recites, inter alia:

"wherein said input light beam, after being transmitted through said phase difference variable element **to be** [sic] into an elliptically polarized light or a circularly polarized light, is transmitted through said phase plate, **to be** [sic] into a linearly polarized light; so that the polarization plane of said input light beam is rotated by an angle corresponding to the phase difference applied by said phase difference variable element." (emphasis added)

The relationship between the "input light beam" and "elliptically polarized light", a "circularly polarized light", or a "linearly polarized light" is unclear and uncertain in the claim. The claim should be re-written to clearly set forth the subject matter the applicants consider as their invention. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 5-6, 10, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 932 068 A2.

'068 publication discloses an optical device with all the limitations set forth in the claims including: a phase plate that has an optical axis in the same direction as, or at a 90 degree angle relative to, a polarization direction of input light beam ("BP" Fig. 21), and applies a desired degree of phase difference between a polarization component

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parallel to the optical axis and a polarization component perpendicular to the optical axis (paragraph 0036); a phase difference variable element that has an optical axis at a +/- 45 degree angle relative to the optical axis of the phase plate, and applies a variable phase difference between the polarization component parallel to the optical axis and the polarization component perpendicular to the optical axis ("6" Fig. 21, paragraph 0073); the phase difference variable element being formed using a material having an electro-optical effect (paragraph 0077); wherein the phase plate may be a doubly refractive $\frac{1}{4}$ wavelength plates (paragraph 0023). Although the reference does not explicitly teach the use of a phase difference adjustment section that adjusts the variable phase difference of the phase difference variable element, such a control element is inherent in the variable phase difference component of the reference.

Regarding claims 10 and 16, the reference discloses a first polarization separation section that carries out polarization separation of light output from an input side optical path (Fig. 33); a second polarization separation element that carries out polarization separation of light output from the variable polarization plane rotator to input lights of predetermined polarization state into an output side optical path (Fig. 33); wherein the amount of light input to said output side optical path is made variable by adjusting a rotation angle of the polarization plane of the linearly polarized light which has been separated by the first polarization separation element (Fig. 33, paragraph 0124).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 932 068 A2.

'068 publication discloses an optical device with all the limitations set forth in the claims as discussed above, except it does not teach the variable polarization plane rotator being of a reflection type. However, the use of reflection elements in folding optical paths, is well known and common in the art. Such configurations are used to dispose optical components in close proximity to each other, thereby making the device more compact and space efficient, while maintaining sufficient optical paths associated with particular device functionality. Therefore, it would have been obvious to a person

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of ordinary skill in the art at the time the invention was made to modify the device of '068 device to have reflection element and fold the optical path, thereby making the device more compact.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 932 068 A2 in view of US 2001/0055262 A1.

'068 publication discloses an optical device with all the limitations set forth in the claims as discussed above, except it does not teach the use of a liquid crystal device as a phase difference variable element. '562 publication, on the other hand, explicitly teaches the use of a liquid crystal device as a phase difference variable element (abstract). Such a device is advantageous because the liquid crystal material allows for an efficient variable phase difference device with low power consumption, thereby increasing the overall efficiency of the device. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify '068 device to have a liquid crystal device as a phase difference variable element.

Allowable Subject Matter

Claims 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: An optical switch having polarization rotator is known in the art. However, none

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of the prior art fairly suggests or teaches An optical switch comprising, inter alia, polarization separation elements, polarization plane coincidence control section, polarization restoring section, and a plurality of polarization combining sections, as claimed in the instant application.

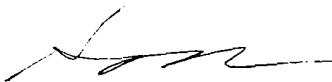
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 20030002131A1, US20010010593A1, US 20030016432A1, US 006493129B2, and US 006339492B1 disclose optical devices comprising variable phase difference elements and phase plates.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (703) 308-4880. The examiner can normally be reached on Monday - Thursday : 6:30am-5:00pm.


The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



sp

Sung H. Pak
Examiner
Art Unit 2874



Brian Healy
Primary Examiner